REMARKS

Careful consideration has been given by the Applicants to the Examiner's comments in the final rejection of the claims, and favorable reconsideration and allowance of the application, as amended, is earnestly solicited.

Applicants note the Examiner's reiterated rejection of Claims 17-22 under 35 U.S.C. 103(a) as being unpatentable over Saunders, U.S. 5,531,876, in view of Ueda, JP 2002155356 (WO 02/20866 cited in an Information Disclosure Statement), as extensively repeated in the present Office Action.

Furthermore, Applicants note the Examiner's reiterated rejection of Claims 23-28 under 35 U.S.C. 103(a) as being unpatentable over Ueda in view of Ikeda, JP 01193463A, as extensively detailed in the present Office Action.

With respect to the rejection of the claims, applicants note that the reiteration of the grounds of rejection appear to be unwarranted inasmuch as clearly and unambiguously the claims, as presently on file, and as amended, provide for patentable distinctions over the art, irrespective as to whether the latter is considered singly or in combination.

In particular, applicants note that the Examiner admits that the structure of Saunders is not directed to a cylindrical arrangement;

whereas also Ueda, although cylindrical, does not provide the various aspect that the clamping element is electrically and thermally conductive and that the recess is convexly rounded.

Consequently, even combining Saunders with Ueda would not lead to the present invention and it would not be obvious to one of skill in the art of this particular technology to derive the invention without inventivity.

However, in order to more clearly emphasize the distinctions, Claims 17 and 18 have each been amended to respectively incorporate the limitation of Claim 19, indicating that the clamping element 6 have selectively rounded or oblique insertion edges 6b, 6c on both sides facing in an axial direction.

Again, the Examiner indicated that the foregoing structure is not at all disclosed, and also not suggested in the art, and applicants submit that the invention provides further structural advantages as described in the specification, as claimed, and as previously argued.

Concerning the foregoing, applicants reiterate the arguments submitted in response to the previous Office Action, noting significant advantages are provided by the clamping elements in that these are being employed in connection with the target support assembly, and are fixed in position in the absence of requiring any further assembly and/or without having to implement any steps of fixing which are deemed to be adversely unduly labor intensive.

The foregoing structure is clearly in contrast with the prior art structures, the latter of which necessitate the use of welding or similar complex fasting procedures, while concurrently the present clamping elements are more sturdily constructed due to their compact configuration, thereby resisting any breakage of the structure during rough handling and operation thereof.

As also indicated with regard to the prior art, the Saunders publication, which has been cited by the Examiner as the primary reference, is completely unlike the present invention and wherein the clamping elements as set forth and claimed herein are extensively protected against any potential breaking off since they are concealed from the exterior and located wedged within a recess.

Moreover, Saunders is also completely distinct from the present invention, concerning which applicants submit the following:

When a target, as described in Saunders, is extensively utilized and thus exhausted, it is necessary to concurrently change the target and the backing plate inasmuch as the target is permanently bonded to the latter, whereas in contrast therewith, the target pursuant to the present apparatus is separate and accordingly removable from a carrying sleeve.

In essence, it is a feature of the present invention to construct a target support assembly possessing clamping elements which connect target sleeve with a support sleeve while presenting an optimized degree of thermal and electrical conductivity.

Reverting in greater particularity to the Examiner's rejection of independent Claims 17 and 18, as well as Claims 20-22 which are either directly or indirectly dependent therefrom, Applicants respectfully reiterate that Claims 17 and 18, as currently amended, are clearly directed to allowable subject matter.

Applicants further submit as follows in traverse of the rejection of the claims, noting that this essentially emphasizes the previously submitted arguments, as follows:

Concerning the foregoing, Applicant note the Examiner contends that the leaf springs in Saunders are angled. However, referring to Figure 2 of Saunders, an angle of these clamping elements would normally be defined between two even or straight lines; however, the particular clamping element which is described in Saunders possesses only a single even or straight line. Moreover, Applicants respectfully disagree with the Examiner that the clamping elements in Saunders have a base on which opposite ends are wedged between the sidewalls of a recess. However, in actuality, the clamping elements of Saunders posses a single base arm which is not wedged, but rather welded at one end thereof to the electrode, in effect, the support sleeve. Consequently, the base arm in Saunders does not actually possess opposite ends, since the one

end which is opposite to that which is welded is the beginning of a curved portion of the clamping element, as illustrated in Figure 2 of Saunders.

Furthermore, even a combination of Saunders with Ueda, the latter of which was cited by applicants in an Information Disclosure Statement, would not be applicable to the invention in that the clamping elements are completely difference as claimed herein from those disclosed in either Saunders or Ueda.

Reverting to Ueda, applicants note as follows:

In Ueda, the clamping elements comprise O-rings but not springs, whereby the combination of Saunders with Ueda only provides a vague suggestion adapted to create a cylindrical support sleeve with the clamping elements, or to create a flat support sleeve as in Saunders with the O-rings from Ueda. Whereas only the first alternative set forth in the art has any kind of limited affinity with the present invention, applicants note that it is crucial that the clamping element of Saunders is welded on the support sleeve at one of its ends, whereas, to the contrary, the inventive clamping element as set forth in the pending claims, is only wedged between the walls of the recess in which the former is located; thereby obviating the necessity for having to implement any welding procedure between components. A mere physical clamping action is adequate in connection with fixing the clamping element in applicants' structure.

Moreover, the clamping elements in Saunders are not capable for effectively clamping two cylindrical sleeves in a radial orientation inasmuch as only the bowed curvilinear part of the clamping element produces a wedging effect which is rather limited and inadequate for functioning in conjunction with the welded end thereof; whereby any application of a radial force against the clamping element would result in breaking off of the latter. This is due to the fact that any such radial force would tend to press along the length of the base arm of the clamping

element, whereas pursuant to the present invention, any radial force exerted against the clamping element is encountered at a right angle relative to the base arm of the clamping element.

Consequently, there is maintained the wedged attachment of the clamping element, as set forth in the claims presented herein, but not the fixed/welded attachment of the clamping element as set forth in Saunders. Moreover, hypothetically, any mounting of the inventive cylindrical target sleeve on the cylindrical support sleeve while substituting a clamping element or plurality of elements pursuant to Saunders would be practically impossible, inasmuch as the Saunders clamping elements provide for a very limited radial welding strength, and the welding attachments are subject to extensive stressing in response to any mounting thereof. Thus, the only feasible manner of mounting the target sleeve onto the support sleeve without extensively stressing the welding element (in a lateral orientation), would be to construct a target sleeve that is equipped with a hinge extending in parallel with the axis of the cylinder. Nevertheless, this represents an extremely complicated and expensive impractical solution to the problem and, moreover, is not disclosed nor even suggested in either Saunders or Ueda.

In view of the foregoing, amended Claims 17 and 18, and Claims 20-22 which are dependent therefrom, are clearly and unambiguously patentably distinct over the art represented by Saunders and Ueda, irrespective as to whether these publications are considered singly or in combination.

Furthermore, with regard to the rejection of Claim 23-28 as being unpatentable over Ueda in view of Ikeda and Morgan, applicants note that this aspect was clearly traversed in response to the previous Office Action pertaining to which the applicants note and reiterate as follows:

Ueda and Ikeda, and particularly Ueda which discloses a method of manufacturing a cylindrical target comprises using a damping member (52) such as constituted of carbon felt, between a metal packing tube as an inner tube and a cylindrical carbon material as an outer tube, connecting both components to each other. This increases the capability of selection of a target material and packing tube material supporting the target material, and also the cylindrical targets can be easily manufactured and reused. A cooling member which is formed as a heat resistant O-ring is disposed at the inner surface portion of the target material. Moreover, the O-ring in Ueda has a convexly rounded cross-sectional form; however, the base of the recess in which it is positioned is not correspondingly rounded, contrary to the present invention, and in which the cross-section in the recess of Ueda is of a rectangular or tapered wall configuration. Consequently, the advantages of providing the rounded base in correspondence with the configuration of the O-ring as provided for by the present invention and the advantages obtained thereby by an increased surface contact area are not at all disclosed in Ueda, and amended Claims 23 and 24, as well as the dependent claims, clearly are novel and patentable thereover.

Reverting to Ikeda, the latter discloses a vacuum sealed structure in a vacuum working device provided to prevent any high frequency electrical wave from leakage, in an economical manner by means of a simple structure through the utilization of a conductive elastic body employed as a vacuum sealing O-ring. This is obtained by the O-ring, having a volumetric resistance value which is less than a specific value distributed over the entire periphery of a vacuum sealing portion. Thus, in the operation of a vacuum working device, a lid (3) which covers the upper surface of a flange (1a) over a chamber (1) has an O-ring (4) fitted in a groove (1b) found in a flange (1a) of a lower chamber (1) that is positioned in an intimate or close contact with a lower surface of the lid (3). This enables a vacuum tank (2) to be completely

sealed from the exterior in order to be able to maintain the vacuum condition, and moreover, high-frequency electrical waves from a high-frequency applying section in the vacuum tank (2), while the high-frequency electrical waves are prevented from leaking from a sealing portion of the vacuum working device, since the conductive O-ring (4) extends over the entire periphery of the sealing portion. Thus, when the O-ring (4) has a volumetric resistance value that is less than 5Ωcm, the shielding property can be readily maintained in order to prevent the high-frequency electrical waves from any leakage.

Hereby, the O-ring which is disclosed in Ikeda, having a convexly rounded cross-sectional shape, is arranged in a groove or recess having a base that is not correspondingly rounded, and consequently this results in a reduced contact surface whereas, in addition, the cross-section of the groove is angled in its wall structure, having reference to Figure 1 of the reference. Consequently, the particular O-ring configuration pursuant to the invention, in cooperation with the correspondingly shaped recess is clearly novel over Ikeda, as set forth in amended Claims 23 and 24, irrespective as to whether Ikeda is considered either singly or in combination with Ueda.

Moreover, a combination of Ueda with Ikeda provides for significant drawbacks in comparison with the present clamping element when in the form of O-rings, as in Figures 6 and 7. Thus, in the prior art there is provided a cylindrical target with compressible electrically conductive, and cross sectionally convexly rounded clamping and sealing elements which are employed in mounting a target sleeve on a support sleeve. The clamping elements are O-rings which are arranged in circumferentially extending recesses each having either a rectangular or angled side walls rather than the curved base portions as provided for by the present invention and claims.

Also, a further major drawback of the prior art structures represented in Ueda and Ikeda resides in that the conductivity between the target sleeve from the support sleeve which is due to the geometry of the O-ring elements and their recesses not being optimized in view of the extremely small contact surfaces which are present between the O-rings which are rounded in transverse cross section, and the shapes of the recesses which are rectangular or angled in their wall surfaces in transverse section, even though the O-rings are essentially of a compressible and somewhat deformable material.

However, the wall of the O-ring does not fully reach and contact the inner corners and wall regions of each respective recess.

In essence, the electrical resistivity of a body having a length L and cross-section A is given by the equation $R_{elec} = \rho \cdot \frac{L}{A}$, wherein ρ is the specific electrical resistivity of the body, and whereby the higher the amount of the resistance the greater the amount of electrical charges can flow off therefrom. The foregoing is quite similar with respect to thermal conductivity, wherein the smaller the cross-section of the conductor and the lengthier the conductor, the higher is the thermal resistance $R_{therm} = \propto \cdot \frac{L}{A}$ wherein A is the contact surface between the O-ring and the recess in which the former is arranged.

Even if the material of the O-ring were to exhibit a low electrical resistivity ρ, the cross-sectionally rounded O-ring in contact with the angled wall or recess will still have a relatively high resistivity.

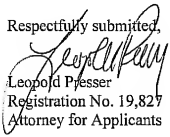
In essence, the foregoing is primarily a reiteration of the previously submitted arguments concerning this art. In addition, Morgan, et al. (U.S. Patent No. 5,591,314) merely discloses use of o-rings in order to provide sealing structures between adjoining or superimposed parts and in essence has nothing in common with the present invention inasmuch as Morgan, et al. merely

provides for utilization of such structure as it is well known in the general state of the art. It is the particular novel structures in conjunction with the clamping elements which provide for the novelty of the present invention as claimed.

Consequently, in summation, and again reiterating all of the arguments with respect to the cited art which was previously traversed by applicants, the early and favorable reconsideration and allowance of the application, as amended, is earnestly solicited.

However, in the event that the Examiner has any queries concerning the instantly submitted amendment, Applicants' attorney respectfully requests that he be accorded the courtesy of possibly a telephone conference to discuss any matter in need of attention.

Respectfully submitted,



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